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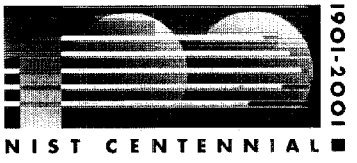
VOLUME 2

Sheilda L. Bryner, Editor



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National Institute of Standards and Technology
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U. S. Department of Commerce
Norman Y. Mineta, Secretary
Technology Administration
Dr. Cheryl L. Shavers, Under Secretary of Commerce for Technology
National Institute of Standards and Technology
Raymond G. Kammer, Director

SYMPOSIUM IN MEMORY OF PROFESSOR HOWARD EMMONS

Howard Wilson Emmons
1912 - 1998

Howard Wilson Emmons
(1912 - 1998)

The fire research community in the United States lost its most influential leader on November 20, 1998 when Professor Howard W. Emmons died of cancer in Boston. He was 86 and an active investigator of fire-related scientific problems right up to the time of his death, e.g., he participated in the 14th Meeting of the US-Japan Natural Resources Panel on Fire Research and Safety in Tokyo and Tsukuba, Japan in June, 1998.

Howard Wilson Emmons was born on August 30, 1912, in Morristown, New Jersey and was educated in the local public schools. He graduated as a Mechanical Engineer from Stevens Institute of Technology with a BS in 1993 and an MS in 1935. He was awarded a ScD degree from Harvard University in 1938 with a dissertation on condensation phenomena. He studied steam turbine systems at Westinghouse for two years followed by one year at the University of Pennsylvania. He was then invited to join Harvard University where he continued his technical career for 58 years. His positions at Harvard included: Assistant Professor - 1940, Associate Professor - 1944, Gordon McKay Professor of Mechanical Engineering - 1949, Abbot and James Lawrence Professor of Engineering - 1966 and Professor Emeritus - 1983.

He was honored by membership in the US National Academy of Science (1966), the National Academny of Engineering (1965) and the American Academy of Arts and Sciences (1946). He was an active member of several professional societies including: the American Physical Society, which awarded him the Office of Naval Research Prize in 1982; the American Society of Mechanical Engineers, which gave him the Timoshenko Medal in 1971; and the Combustion Institute, from which he received the prestigious Egerton Gold Medal in 1968. Stevens Institute of Technology bestowed an honorary ScD (1963), its 100th Anniversary Medal (1970) and the Stevens Honor Award Medallion (1977). He was named Fire Protection Man of the Year by the Society of Fire Protection Engineers in 1982. Worcester Polytechnic Institute awarded him an honorary doctorate in 1983.

Professor Emmons' teaching was always accompanied by research and consulting. During World War II, he carried out gas turbine research for Pratt and Whitney and advised Aberdeen Proving Ground on the design and construction of its first supersonic wind tunnel.. He served on numerous government panels and committees beginning with the Naval Technical Mission to Europe in 1945. From 1958 until 1970, he was a member of the Space Science and Technology panel of the Presidential Scientific Advisory Council. In the fire research area, he was a founding member of the Committee on Fire Research in the National Research Council of the National Academy of Sciences from 1956 to 1976, serving as Chairman from 1967 to 1970. He also chaired the National Bureau of Standards Panel 490 which had oversight responsibility for the Center for Fire Research from 1971 to 1976. He played a critical role in the establishment of the Factory Mutual Research Corporation in 1964 and helped guide its development into a foremost industrial fire research laboratory. He was a member of the Products Research Committee from 1974 to 1979. He also advised his home state of Massachusetts on Fire Science

and on Science and Technology. He served as a member of the Lincoln-Sudbury from 1969 to 1972.

We are fortunate he chose to direct his talents to Fire Research nearly 50 years ago under the urging of Professor Hoyt Hottel. In 1956, Emmons published a landmark paper on boundary layer burning which has become know as the "Emmons Problem". Shortly thereafter, he prepared the booklet "A Fire Research Program for the United States" which serves as a blueprint for the next 30 years' effort. He contributed to *Fire Research Abstracts and Reviews* and to the seminal conference proceedings, "The Use of Models in Fire Research". In 1962, he chaired the National Academy of Science sponsored Summer Study on Fire Research at Woods Hole, which recommended a federal program in fire research as the only practical way tao enlarge the then weak scientific base for fire safety design.

The formal development of the fire research program at Harvard had its beginning in his world-wide survey of fire laboratories in 1966-1967 and his observation of the disparity among the then nationally accepted flammability standards. As Chairman of the Committee on Fire Research, he spearheaded the effort of the scientific community to identify fire research as a national priority. He argued before Congress for a Fire Research and Safety Act, which was adopted in 1968. This act gave the National Bureau of Standards (now the National Institute of Standards and Technology) responsibility for the technical aspects of the fire problem and led to the establishment of the Center for Fire Research (now the building and Fire Research Laboratory). The act also empowered the Presidential Commission that published "America Burning" in 1972.

The National Science Foundation under its Research Applied to National Needs program initiated funding of the "Home Fire Project" at Harvard University - Factory Mutual Research Corporation in 1972. The success of that project, under the direction of Howard Emmons along with Raymond Friedman, is well documented in its 1982 final report. One of its accomplishments was the Harvard Compartment Fire Code, or Fire Simulation Technique (FIRST), which predicts the growth of fire in buildings and remains a useful tool today.

Howard Emmons had major renown as both an inspiring teacher and an innovative researcher. He set the tone for the unusually scholarly community in the Division of Applied Sciences at Harvard University. His 50 doctoral students include many distinguished scientists. His research associates were attracted to fire safety science through Professor Emmons' boundless enthusiasm. It is their consensus that the time spent with Howard is the highlight of their careers. He had the uncommon ability to ignore error and develop what was correct so that it seemed as if it were all your idea in the first place. His over one hundred research papers are hallmarks of clarity and understanding. A skillful experimentalist, as well as a theorist of unusual mathematical competence, he saw the essential concepts in complex problems and addressed them with energetic single-mindedness until he produced solutions bursting with insight and elegance.

Many of his ideas reached fruition in the laboratory and computer facility he constructed in his home. He is survived by three children and three grandchildren. His wife, Dorothy, died in 1991. His daughter, Beverly, is a theatrical lighting designer and Artistic Director of the Lincoln Center Institute in New York. His son, Dr. Scott Emmons of Brooklyn, is Siegfried Ullmann

Professor of Molecular Genetics at Albert Einstein College of Medicine. His son, Keith Emmons, serves as a fund-raiser for non-profit organizations in Los Gatos, CA. The grandchildren are Annie Simon of Brooklyn and Alexandra and Andrew Emmons of Los Gatos.

It is not possible to properly summarize the magnitude of Professor Emmons' unique contributions to the establishment of fire safety science as a discipline, other than to call him "Mr. Fire Research". We gratefully acknowledge our debt to Professor Emmons for his insistence on technical quality, his excellent leadership, his extraordinary gift for inspiring colleagues and his many warm friendships. He will be dearly missed.

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